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Implementation of High Temperature Superconducting Leads in research cryostats YUKO SHIROYANAGI, Ohio State University, GOKUL GOPALAKRISHNAN, DONGKYUN KO, SANGHUN AN, Ohio State Univeristy, THOMAS GRAMILA, Ohio State University — While High Temperature Superconducting (HTSC) Magnet Leads are available for use in high current applications when combined with active cryocoolers, they are typically not used in liquid Helium based research cryostats because of the difficulty of implementation. We have successfully implemented a HTSC lead system for Helium based cryostats in which baffles provide thermal coupling to the outgoing Helium gas. The increase in the Helium boiloff rate at full current (110amps) has been measured to be 0.4L/day as compared with the zero current boiloff. An essential element of the design is maintaining a temperature at the warm end of the HTSC leads which is well below the critical temperature. Measurements indicate that this temperature is roughly 65K at 110A. The basic design approach and actual implementation of this novel HTSC lead system, as well as its measurement, are discussed.

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